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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/700,157	11/10/2000	Michel Gratzel	017769-00040	2562

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EXAMINER	
RUTHKOSKY, MARK	

ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 03/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/700,157	GRATZEL ET AL.	
	Examiner	Art Unit	
	Mark Ruthkosky	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 December 2002*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *17-31 and 34* is/are rejected.

7)☐ Claim(s) *32-33 35-36* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 December 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

The rejection of claims 1-16 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention has been overcome by canceling the claims.

Claims 18 and 35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 18 includes an improper Markush group. A proper Markush group should read, "selected from the group consisting of" and where the group is closed by the word "and." In claim 2, the group is closed by the word "or."

In claim 18, the variables x and y in the formulae are not defined for each compound in the claim. As the claim leaves the formulae of the compositions open, one of ordinary skill in the art does not know what the limitations of the claim include as part of the claimed subject matter. As such, the limitations of the claims are not clear and are therefore indefinite.

In claim 35, the abbreviation DSA is not defined.

Further, the applicant is requested to review the claims for misspellings and grammatical errors. For example, the word "molten" is misspelled in claim 29 and in claim 25 the words "and" and "then" are connected.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 17, 26, 28, and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Frech et al. (US 5,601,796.)

The instant claims are to an electrochemical generator comprising two electrodes supporting different electro-active materials, the electrodes being connected together by an electrolyte, wherein the electro-active material used in the composition of at least one electrode includes one of an oxide or chalcogenide of transition metals, or their at least partially lithiated form.

Frech et al. (US 5,601,796) teaches an electrochemical cell comprising two electrodes supporting different electro-active materials, the electrodes being connected together by an electrolyte, wherein the electro-active material used in the composition of at least one electrode includes one of an oxide or chalcogenide of transition metals, or their at least partially lithiated form (col. 2, line 64-col. 3, line 55.)

Claims 17, 18, 19, 22, 26-28, 31 and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by Kawakami et al. (US 6,165,642.)

Kawakami et al. (US 6,165,642) teaches an electrochemical cell comprising two electrodes supporting different electro-active materials, the electrodes being connected together by an electrolyte, wherein the electro-active material used in the composition of at least one electrode includes one of an oxide or chalcogenide of transition metals, or their at least partially lithiated form (col. 9, line 45 to col. 12, line 50, the examples and the claims.) The materials are lithium transition metal oxides that have pore sizes and specific surface areas in the claimed range of claim 18. These structures are ordered and porous forming a mesostructure. Examples include particles of 5-15 microns and nanometer sized particles. Lithium metal compounds are

inherently stacked in a hexagonal lattice. Electrode and electrolyte compositions are noted. Thus, the claims are anticipated.

Claims 20, 21, 24 and 25 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kawakami et al. (US 6,165,642.)

Kawakami et al. (US 6,165,642) teaches an electrochemical cell comprising two electrodes supporting different electro-active materials, the electrodes being connected together by an electrolyte, wherein the electro-active material used in the composition of at least one electrode includes one of an oxide or chalcogenide of transition metals, or their at least partially lithiated form (col. 9, line 45 to col. 12, line 50, the examples and the claims.) The materials are lithium transition metal oxides that have pore sizes and specific surface areas in the claimed range of claim 18. These structures are ordered and porous forming a mesostructure. Materials are shown to have a diameter of 5-15 microns (see comp. Example 1.) Electrode and electrolyte compositions are noted. These claims are product-by-process claims. MPEP 2113 states, "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process."

Claims 18, 22, 26-18 and 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Frech et al. (US 5,958,624.)

Frech et al. (US 5,958,624) teaches a battery incorporating a meso-structural metal oxide material. The battery has two electrodes connected together by an electrolyte (column 9.) The

electrodes have a pore size of 2-20 nm, which falls in the range of 0.001 to 10 microns and a specific surface area of 650 to 1400 m^2/g, which falls in the range between 2 and 2000 m^2/g (see claims 1-6; it is noted that 0.001 micron is 1 nm.) Various compounds are noted including lithiated metal oxides. Meso-structured tin and iron oxides are noted in col. 9, lines 15-25 and example 2. The generic formula of claim 1 of the reference also reads on the structure SnM_xO_y where M is a glass-forming element. Other cathode materials including MnO_2 are noted in col. 9 and example 2. The materials are mesophased structures with interconnected pores to intercalate lithium ions (col. 9, throughout the reference.) Electrolyte materials are described in col. 9, lines 30-50.) Inorganic and polymeric electrolytes, which act as insulating separators, are disclosed in col. 9, lines 45-50 and in example 1. Current collecting conductive matrices are described in example 1. Thus, the claims are anticipated.

Claims 20, 21, and 24 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Frech et al. (US 5,958,624).

The product-by-process claims are noted. The teachings of Frech et al. (US 5,958,624) have been provided. Processes taught in col. 6, where precursor materials are reacted with surfactant materials in aqueous solutions (see lines 5-25.) MPEP 2113 states, "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process."

Claim Rejections - 35 USC § 103

Claims 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami et al. (US 6,165,642) as applied, and further in view of Green et al. (US 6,245,847.)

The teachings of Frech et al. (US 5,958,624) have been provided. Kawakami et al. (US 6,165,642) does not teach the electrolyte to include a molten solvent. Green et al. (US 6,245,847), however, teaches electrolyte compositions for lithium cells which include molten salts for the lithium ion containing salts (column 1.) The examples include various molten salts including EMI in example 1. It would be obvious to one of ordinary skill in the art at the time the invention was made to include a molten electrolyte salt as taught by Green et al. (US 6,245,847) in the battery of Kawakami et al. (US 6,165,642) as the electrolyte will provide at equivalent means of transporting ions as the lithium ions salts provided in the battery while minimizing leakage and flammability as taught by Green et al. (US 6,245,847.)

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami et al. (US 6,165,642) in view of Corrigan (US 4,663,256.)

Kawakami et al. (US 6,165,642) teaches an electrochemical cell comprising two electrodes supporting different electro-active materials, the electrodes being connected together by an electrolyte, wherein the electro-active material used in the composition of at least one electrode includes one of an oxide or chalcogenide of transition metals, or their at least partially lithiated form (col. 9, line 45 to col. 12, line 50, the examples and the claims.) The materials are lithium transition metal oxides that have pore sizes and specific surface areas in the claimed range of claim 18. These structures are ordered and porous forming a mesostructure. Examples include particles of 5-15 microns and nanometer sized particles. Lithium metal compounds are

inherently stacked in a hexagonal lattice. Electrode and electrolyte compositions are noted. Kawakami et al. (US 6,165,642) does not teach that the material has an aspect ratio of at least 4 and is connected to other members in at least two points. As the prior art teaches materials smaller than 300 nm, the changes in size or shape of the active material is not considered inventive (MPEP 2144.04), as there changes would be obvious to one of ordinary skill in the art at the time of the invention. Changes in the aspect ratio of a material are well known in the art to enhance the surface area of the material and the contact of the material with a current collector (as taught in US 4,663,256, col. 3.) One of ordinary skill in the art will effective manage the surface area in order to achieve a desired result such as increasing the surface area of the material or improving the adhesion of the material to a current collector. This rejection may be overcome by submitting *unexpected* results for the material as the claimed.

Allowable Subject Matter

The following is a statement of reasons for the indication of allowable subject matter: Claims 32, 33, 35, and 36 contain allowable subject matter. The prior art does not teach an electrochemical generator comprising two electrodes supporting different electro-active materials, the electrodes being connected together by an electrolyte, wherein the electro-active material used in the composition of at least one electrode includes one of an oxide or chalcogenide of transition metals, or their at least partially lithiated form wherein the electro-active material is composed of TiO_2, in anatase form having a mesoporous structure.

Response to Arguments

Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

The evidence submitted is insufficient to establish a conception of the invention prior to the effective date of the Frech et al (US 5,958,624) reference. While conception is the mental part of the inventive act, it must be capable of proof, such as by demonstrative evidence or by a complete disclosure to another. Conception is more than a vague idea of how to solve a problem. The requisite means themselves and their interaction must also be comprehended. See *Mergenthaler v. Scudder*, 1897 C.D. 724, 81 O.G. 1417 (D.C. Cir. 1897). With regard to the claims, it appears that claims 17 and 19 are supported in the evidence submitted with the declaration. It does not appear that the exhibits support the subject matter of the remaining claims.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mark Ruthkosky
Primary Patent Examiner
Art Unit 1745

3/10/04